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TECHNICAL NOTE

MT8820A

Radio Communication Analyzer

ANRITSU CORPORATION

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MT8820A Radio Communication Analyzer

Technical Note

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1. MT8820A GPIB control procedure

This chapter indicates common GPIB procedures of the MT8820A and covers all measurement software.

1.1 Basic sequence

The MT8820A is able to measure both TX and RX test items at once. Therefore, basic measurement flow should be 1)parameter settings, 2)measurement, 3)result reading, as shown in Fig.1-1 below. Most of the auto test software consists of a combination of this flow.

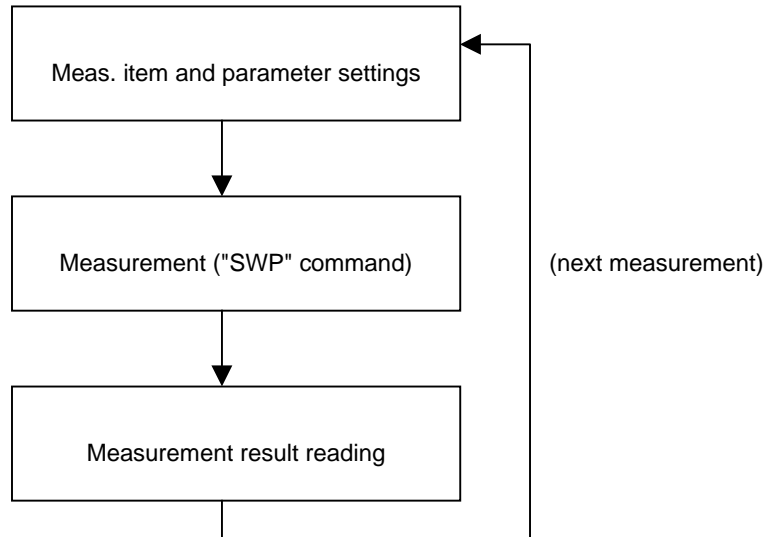


Fig.1-1 Basic measurement flow

The following points must be noted when reducing the time of a measurement sequence:

- Settings of measurement items and parameters should be kept to minimum. (Do not perform unnecessary settings.)
- Items should be measured as collectively and simultaneously as possible. (TX measurement and RX measurement)
- Do not read any items not being measured or unnecessary results in measurement result readings.

NOTE:The“SWP” command stops remote control temporarily until the measurement ends. Refer to “1.2 Measurement start and synchronization” for details.

1.2 Measurement start and synchronization

The use of synchronous measurement command “SWP” at measurement start simplifies the programming for measurement.

The Synchronous measurement command stops remote control temporarily until the measurement ends. The temporary stop automatically keeps the next command waiting until the end of measurement.

This control method eliminates the need to monitor the measurement end on the control program. In other words, there is no need to insert appropriate wait time depending on the measurement command.

Synchronous meas. command	SWP
Asynchronous meas. command	S1,S2,CONT

[Sample program]

(If synchronous meas. command is used)

```
write_gpib(MT8820A,"SWP");           //Issue sync. meas. start command
write_gpib(MT8820A,"TXPWR? DBM");    //Issue result reading command
TxPowerResult=read_gpib(MT8820A);    //Read meas. result
```

(If asynchronous meas. command is used)

```
write_gpib(MT8820A,"S1");           //Async. meas. start command
do{
    write_gpib(MT8820A,"MSTAT?");    //Meas. status reading command
    status = read_gpib(MT8820A);     //Read meas. status
    wait(100);                       //Wait 100msec
}while(status == 9);                // 9: Under Measurement
write_gpib(MT8820A,"TXPWR? DBM");    //Issue result reading command
TxPowerResult=read_gpib(MT8820A);    //Read meas. Result
```

1.3 Batch setting of measurement items

All measurement items' On/Off, judgement On/Off and average count can be set in a batch.

GPIB command: ALLMEASITEMS [parameters]

Parameter's format

Measurement On/Off per item, judgement On/Off and average count are written as parameters.

Refer to the section of remote control in operation manual for details.

1.4 Batch reading of all measurement values

There is a batch reading command that allows all measurement values to be read as a single item.

GPIB command: ALLMEAS?

Refer to the section of remote control in operation manual for details.

1.5 Confirmation of connection status

The status of the connection with a terminal can be confirmed with the connection status query command.

Connection status query command	CALLSTAT?
---------------------------------	-----------

Query of connection status simplifies the programming for controlling connection/disconnection with terminals.

[Sample program]

(For connection with terminals by Paging)

```
do{
    write_gpib(MT8820A,"CALLSTAT?");
    call_status = read_gpib(MT8820A);
    if(call_status == 1){ // 1: Idle
        write_gpib(MT8820A,"CALLSA");//Paging command
    }
    wait(100); //Wait 100msec
}while(call_status != 7); // 7: Communication
```

1.6 Measurement System selection (change-over)

Measurement software which is installed in MT8820A is changed by command of measurement software selection.

Command of measurement software selection	STDSEL system
Selection of system	WCDMA, GSM, CDMA2K, PDC,PHS

Note that the MT8820A can not receive GPIB commands while the measurement software is changing. Therefore a wait time is needed until the next command is sent after the measurement software selection command is sent.

For a system change-over between W-CDMA and GSM, a delay of 3 sec or more is needed. For a system change-over between GSM and W-CDMA, a delay of 3 sec or more is needed. All other system change-over require a wait time of 30 to 60 seconds.

[Sample program]

(System change of W-CDMA to GSM)

```
write_gpib(MT8820A, "STDSEL?"); //Inquiry of current system
current_system = read_gpib(MT8820A); //W-CDMA is read
write_gpib(MT8820A, "STDSEL GSM"); // System change to GSM
wait(3000); // It waits for 3 seconds.
write_gpib(MT8820A, "STDSEL?"); // Inquiry of current system
current_system = read_gpib(MT8820A); //GSM is read
```

2. MX882001A GSM Measurement Software GPIB control procedure

This chapter indicates common GPIB procedures of MX882001A GSM measurement software.

2.1 Measurement item and parameter settings

By making use of the batch measurement feature (ALLMEASURE) it is possible to maximize the performance of the MT8820A.

2.2 Relationship between measurement item selection and measurement time

Table 2-2-1 below shows the relationship between measurement items and measurement time.

Meas Item	Average time	Meas On/Off							
		Cond1	Cond2	Cond3	Cond4	Cond5	Cond6	Cond7	Cond8
Modulation Analysis	100	On	On	On	On	On	Off	On	Off
RF Power	100	Off	On	On	On	On	Off	On	Off
Power vs Time	100	Off	Off	On	On	On	Off	On	Off
Template	100	Off	Off	Off	On	On	Off	On	Off
Output RF Spectrum	100	Off	Off	Off	Off	On	On	On	Off
BER	Initial value	Off	Off	Off	Off	Off	Off	On	On
Measurement time [s]		0.747	0.801	0.807	0.789	1.011	1.011	10.018	10.018

Table 2-2-1 Relationship between measurement items and measurement time

NOTE: The Measurement time is the average when used with the average number of TX measurements set to 100 from initial value at factory shipment (Preset+Power On). If the average number is reduced to 10 for example, the measurement time is shorter than the communication time of GPIB command (approx. 100msec), therefore, there is no difference due to measurement parameters.

Synchronous meas. start command "SWP" is used for starting measurements.

The measurement time is almost the same in Cond1~4. Therefore, **[Time to change settings]** can be shortened by fixing to Cond4 for measurements under Cond1~4.

For Cond5 and 6, measurement time of Output RF Spectrum becomes dominant because the measurement time of Output RF Power Spectrum is longer than the measurement of Modulation Analysis, RF Power, Power vs Time and Template under the same number of measurements. Thus, measurement time does not change, even in Cond5, under the condition in which measurement time of Output RF Spectrum becomes dominant. When measuring Output RF Spectrum, **[Time to change settings]** can be shortened by eliminating On/Off setting of other measurement items. For Cond7 and 8, similarly to Cond5 and 6, **[Time to change settings]** can be shortened by eliminating On/Off of other measurement items except BER measurement.

e.g.) Supposing measurement is repeated 4 times and each is performed as shown in Table 2-2-2, change of settings in accordance with Table 2-2-3 shortens **[Time to change settings]** and as a result, **[Comprehensive measurement time can be shortened]**.

In Table 2-2-3, measurements are performed in 4 patterns of On/Off settings, changed from initial setting. (Setting changes are indicated in bold frames)

Meas Item	Items to measure in each STEP (marked with √)			
	Meas 1 st	Meas 2nd	Meas 3rd	Meas 4th
Modulation Analysis		√		√
RF Power	√	√		√
Power vs Time		√		√
Template		√		
Output RF Spectrum		√		
BER			√	

Table 2-2-2 Measurement example

Meas Item	Meas Item On/Off setting in each STEP			
	Meas 1 st	Meas 2nd	Meas 3rd*1	Meas 4th*2
Modulation Analysis	On	On	On	On
RF Power	On	On	On	On
Power vs Time	On	On	On	On
Template	On	On	On	On
Output RF Spectrum	Off	On	On	Off
BER	Off	Off	On	Off

Table 2-2-3 Transition table of measurement item setting in performing measurements shown in Table 2-2-2

*1: Output RF Spectrum is not set to OFF even if it is not required as the measurement time is influenced by the BER.

*2: If not measuring BER and Output RF Spectrum, they can both be set to OFF due to the measurement time influence of BER and Output RF Spectrum.

2.3 Parameter settings

The MT8820A prepares commands to perform several settings with one command in each parameter setting.

2.3.1 Simultaneous setting of Channel and MS Power Level (Version2.0 or later)

Channel and MS Power Level can be set simultaneously.

GPIO command: CHMSPWR channel, level

e.g. To set 62 for Channel, and 10 for MS Power Level

CHMSPWR 62,10

2.3.2 Batch reading of Average, Maximum and Minimum per measurement value

Average, Maximum and Minimum per measurement value can be recalled with one command.

One query command is issued for judgement result and avg./max./min. of measurement result in CSV format.

Note: Judgement result value is always 9 (Not judged) in Version2.** or earlier. It is reserved for this use in Version 2.** or later.

[Basic form of query command and reading value]

TTL_[Meas Item]?

Response: judge,avg,max,min

Meas Item	Query Command	Note
Tx Power	TTL_TXPWR? Unit	DBM or WATT is specified for unit.
Carrier Off Power	TTL_OFFPWR?	
On/Off Ratio	TTL_RATIO?	
Power Flatness Maximum Power	TTL_MAXPWR?	
Power Flatness Minimum Power	TTL_MINPWR?	
Time Alignment	TTL_TMALMENT?	
Power vs Time(Leading)	TTL_PTLEAD? N	n=1~6 correspond to meas. point Time1~Time6.
Power vs Time(Trailing)	TTL_PTTRAIL? N	
Template	TTL_PWRTEMP?	
Carrier Frequency Error	TTL_CARRFERR? Unit	HZ or PPM is specified for unit.
RMS Phase Error	TTL_PHASEERR?	
Peak Phase Error	TTL_PPHASEERR?	
Magnitude Error	TTL_MAGTDERR?	
Due to Modulation (Lower side)	TTL_LMODPWR? Offset	Any of these is specified for offset: 0KHZ,200KHZ,250KHZ,400KHZ. 600KHZ,800KHZ,1000KHZ,1200 KHZ,1400KHZ,1600KHZ,1800KH Z,2000KHZ.
Due to Modulation (Upper side)	TTL_UMODPWR? Offset	
Due to Switching (Lower side)	TTL_LSWPWR? Offset	
Due to Switching	TTL_USWPWR? Offset	

2.3.3 Batch reading of Error rate, Error event, Received bit, Number of Sample in BER measurement value

Error rate, Error event, Received bit, Number of Sample per BER measurement value can be recalled with one command.

Once the query command is issued, judgement result, error rate, error event, received bit and number of sample can be read in CSV format.

Note: The judgement result value is always 9 (Not judged) in Version2.** or earlier. It is reserved for this use in Version2.** or later..

[Basic form of query command and reading value]

TTL_[Meas Item]?

Response: judge,ratio,error_event,receive_event,sample

Meas Item	Query Command	Note
FER	TTL_BER? FER	
CRC	TTL_BER? CRC	
Cib	TTL_BER? CIB	
CII	TTL_BER? CII	
Fast	TTL_BER? FAST	
BER(Ext. BER Input)	TTL_BER? BER	
GPRS BER	TTL_BER? GPRSBER	
Block Error Rate	TTL_BLER?	

3. MT8801 PHS / MT8820A PHS(MX882005A) remote command compatibility table

The following is compatible remote commands between MT8801B/C PHS and MT8820A PHS. This table was created from the viewpoint what commands are written for MT8820A PHS on the basis of MT8801B/C PHS operation manual.

3.1. MT8801B / MT8801C common command

Below are comparison tables for commands that are commonly used in each system software (e.g. GSM, PDC, PHS) of MT8801B/C.

(1) Save / Recall command

Function	MT8801	MT8820A	Note
Recall	RCM n	PRMRECALL n	
Save	SVM n	PRMSAVE n	

(2) Copy command

Function	MT8801	MT8820A	Note
Hard Copy	PRINT PLS 0	-----	

(3) Measurement command

Function	MT8801	MT8820A	Note
Single meas.	SNGLS S2	SNGLS S2	
Single meas. (Sync)	SWP TS	SWP TS	
Continuous	CONTS S1	CONTS S1	
Meas./Sweep status Recall	SWP?	SWP?	Response messages of MT8820A are below. 0: Measurement end 1: During measurement
Stop	-----	MEASSTOP	

(4) Preset command

Function	MT8801	MT8820A	Note
Preset	PRE *RST INI IP	PRESET *RST PRE INI IP	
Preset Value	POWERON LAST	PRESET POWERON	

(5) Waveform Memory Recall command

Function	MT8801	MT8820A	Note
I-Q	XME? p0,p1,d	XME? p0,p1,d	
Origin Offset	OXMC? p0,d	-----	
Magnitude Error	XMN? p,d	XMN? p,d	
Phase Error	XMP? p,d	XMD? p,d	
Vector Error	XMV? p,d	XMV? p,d	
Wide Dynamic Range Power	-----	XMW? p,d	MT8820A generates the Wide Dynamic Range waveform.
Power Measurement (RF Power)	XMD? p,d	XMD? p,d	
Occupied Bandwidth			
Occ.bw(Spectrum)	XMB? p,d	-----	
Occ.bw(High Speed)	XME? p,d	XME? p,d	
Adjacent Channel Power			
Adj.ch(Spectrum)	XMB? p,d	-----	
Adj.ch(High Speed)	XMS? p,d	-----	To be supported in/after Dec.
Adj.ch(Graph)	XMAG? p,d	-----	
Demodulation	XMM? p,d	XMM? p,d	
Output Format			
ASCII	BIN 0 BIN OFF	-----	
BINARY	BIN 1 BIN ON	-----	

(6) Panel Mode Change command

Function	MT8801	MT8820A	Note
Tx / Rx Tester	PNLMD TESTER	SCRSEL FMEAS	*1
Analog Tester	PNLMD ANALOG	-----	
Instrument Setup	PNLMD SYSTEM	SCRSEL SYSCFG	*1
Spectrum Analyzer	PNLMD SPECT	-----	

*1 : MT8820A has similar commands as above, however, they are not necessary because parameter setting is performable on any screen.

(7) Back Screen command

Function	MT8801	MT8820A	Note
Back Screen	BS	-----	Not necessary because the setting of MT8820A does not depend on screens.

(8) Expansion Event Status command

Function	MT8801	MT8820A	Note
END Event Status			
Status Enable	ESE2 n	ESE2 n	*2
Status Enable (Query)	ESE2?	ESE2?	*2
Status Resister	ESR2?	ESR2?	*2
ERR Event Status			
Status Enable	ESE3 n	ESE3 n	*2
Status Enable(Query)	ESE3?	ESE3?	*2
Status Resister	ESR3?	ESR3?	*2

*2 : MT8801 and MT8820A have different parameters. Please refer to MT8820A operation manual for detail.

(9) Main common command

Function	MT8801	MT8820A	Note
Serial No. Query	SERIAL?	SERIAL?	
Screen On	-----	SCREEN ON	
Screen Off	SCREEN OFF	SCREEN OFF	

3.2. Instrument Setup command

The following is setting items on [System Configuration] screen of MT8820A.

Function	MT8801	MT8820A	Note
Reference Frequency			
10 MHz (Int)	-----	REF 10MHZINT	
10 MHz	REF 10MHZ	REF 10MHZEXT	
13 MHz	REF 13MHZ	REF 13MHZEXT	
RF Input / Output			
Main	RFINOUT MAIN	RFOUT MAIN	Only Output setting is available in MT8820A. Input is performed only in Main.
AUX	RFINOUT AUX	RFOUT AUX	
Main – in Aux – out	RFINOUT MAINAUX	-----	
Main – out Aux – in	RFINPUT AUXMAIN	-----	
Display On	DSPL ON	DISPL ON	
Display Off	DSPL OFF	DISPL OFF	
Title display			
Date / Time	TTL DATE	TTL DATE	
User	TTL USER	TTL USER	
Off	TTL OFF	TTL OFF	
Title input	TITLE title_type	TITLE title_type	
Date Display Mode Select			
Year-Month-Day	DATEMODE YMD	DATEMODE YMD	
Month-Day-Year	DATEMODE MDY	DATEMODE MDY	
Day-Month-Year	DATEMODE DMY	DATEMODE DMY	
Date Setting	DATE year,month,day	DATE year,month,day	
Time Setting	TIME hh,mm,ss	TIME hh,mm,ss	
Buzzer Switch ON	ALARM ON BEP ON BEP 1	ALARM ON BEP ON BEP 1	
Buzzer Switch OFF	ALARM OFF BEP OFF BEP 0	ALARM OFF BEP OFF BEP 0	
Sound Buzzer	BZR	BZR	
GPIB Terminator			
LF	TRM 0	TRM 0	
CR / LF	TRM 1	TRM 1	
Print Type			
ESC/P (24DOT)	PMOD 6	-----	
HP	PMOD 3	-----	
BMP(B&W)	PMOD 11	-----	

3.3. Tx / Rx Tester command

The following is setting items on [Fundamental Measurement] screen of MT8820A.

(1) System Mode Change command

Function	MT8801	MT8820A	Note
W-CDMA	-----	STDSEL WCDMA	
CDMA2000	-----	STDSEL CDMA2K	
GSM	SYS GSM	STDSEL GSM	
PDC	SYS PDC	STDSEL PDC	
PDC Call Processing	SYS PDC_CP	STDSEL PDC	
PHS	SYS PHS	STDSEL PHS	
PHS Call Processing	SYS PHS_CP	STDSEL PHS	

(2) Tx meas. screen change command / Rx meas. screen change command

MT8820A is able to perform all measurements as long as Fundamental Measurement Screen is selected, therefore, screens do not need to be changed per measurement item.

(3) Measurement result status

Function	MT8801	MT8820A	Note
Meas. result status	MSTAT?	MSTAT?	
Tx meas. result status	-----	TXMSTAT?	MT8820A is able to recall measurement result status for TX and RX, independently.
Rx meas. result status	-----	RXMSTAT?	

(4) Trigger Timeout command

Function	MT8801	MT8820A	Note
Trigger Timeout	TRGWAIT time	RX_TIMEOUT time	

(5) Remeasurement command when screen changes

Function	MT8801	MT8820A	Note
Remeas. Mode ON	REMEAS ON	-----	Once MT8820A starts measurement, it does not stop when screen changes. (Measurement stops only when Sequence Monitor screen changes, however, Sequence Monitor screen does not have measurement items.)
Remeas. Mode OFF	REMEAS OFF	-----	

(6) RF Input / Output connector change command

Function	MT8801	MT8820A	Note
RF Input / Output			
Main	RFINOUT MAIN	RFOUT MAIN	Only Output setting is available in MT8820A. Input is performed only in Main.
Aux	RFINOUT AUX	RFOUT AUX	
Main – in Aux – out	RFINOUT MAINAUX	-----	
Main – out Aux – in	RFINOUT AUXMAIN	-----	

(7) 10 MHz / 13 MHz reference input test command

Function	MT8801	MT8820A	Note
Reference Input	EXTREF?	-----	

3.4. Setup Common Parameter command

Function	MT8801	MT8820A	Note
DUT Control			
Call Processing	DUTCTRL CALLP	CALLPROC ON	
None	DUTCTRL NONE	CALLPROC OFF	
TCH Channel	CHAN ch	CHAN ch	
TCH UL Frequency	TFREQ freq	TFREQ freq TXFREQ freq ULFREQ freq	
TCH DL Frequency	RFREQ freq	RFREQ freq RXFREQ freq DLFREQ freq	
Control Channel	CTRLCH ch	CTRLCH ch	
Reference Level	RFLVL level	RFLVL level ILVL level	
Output Level	OLVL level	OLVL level SGLVL level	
Measuring Object			
PS-TCH	MEASOBJ PSTCH MEASOBJ PSCOM	MEASOBJ PSTCH	
PS-SYNC	MEASOBJ PSSYNC	MEASOBJ PSSYNC	
CS-TCH	MEASOBJ CSTCH MEASOBJ CSCOM	MEASOBJ CSTCH	
CS-SYNC	MEASOBJ CSSYNC	MEASOBJ CSSYNC	
Continuous	MEASOBJ CONT	MEASOBJ CONT	
Output Signal Pattern			
PS-TCH	-----	OSIGPAT PSTCH	
PS-SYNC	-----	OSIGPAT PSSYNC	
CS-TCH	-----	OSIGPAT CSTCH	
CS-SYNC	-----	OSIGPAT CSSYNC	
Continuous	-----	OSIGPAT CONT	
Slot Number	SLTNUM n	SLTNUM n	
TCH Test Pattern			
PN9	TCH PN9	TCH PN9	
PN15	TCH PN15	TCH PN 15	
Echo Back	TCH ECHO	TCH ECHO	
Pattern Data (Continuous)			
PN9	PAT PN9	PAT PN9	
PN15	PAT PN15	PAT PN15	
Bit	PAT bit	PAT bit	

3.5. Call Processing screen command

(1) Sequence Monitor screen command

Function	MT8801	MT8820A	Note
Start Test	CALLSA	-----	*1
Stop Test	CALLSO	-----	*2
Paging	CALLPG	CALLSA	
Disc from NW	CALLDISC	CALLSO	
Refresh Status	CALLRFR	CALLRFR	
Scenario Load			
File No.	SLOAD n	-----	
Default	SLOAD DEFAULT	-----	
Call Processing Status	CALLSTAT?	CALLSTAT?	
Call Processing Error	CALLERR?	CALLERR?	
Call Processing Result	CALLRSLT? Seq_code	CALLRSLT? seq_code	
PS-ID	CALLPSID?	CALLPSID?	
PS Phone No.	CALLPSNO?	CALLPSNO?	
NW Phone No.	CALLNWNNO?	CALLNWNNO?	
Transmit Timing	CALLTMAL?	-----	
Input Level	CALLLVL?	CALLLVL?	
Current Channel	CALLCH?	CALLCH?	
Multi Response	SEQMONMEAS?	PSREPMEAS?	*3

*1 : In MT8820A, Call Processing Status becomes Idle when Call Processing is turned On.

Start Test is not necessary.

*2 : MT8820A does not have Call Processing Status Stop. (Corresponding status is Call Processing Off .)

*3 : Response message is different from that of MT8801. Please refer to MX882005A operation manual for detail.

(2) Setup Call Processing Parameter Screen command

Function	MT8801	MT8820A	Note
Control Channel Slot	CTRLSLT n	CTRLSLT n	
CS-ID	CSID h	CSID h	
Country Code	CNTRY h	CNTRY h	
Paging PS No.			
Auto	PGPSNO AUTO	PGPSNO AUTO	
Fix	PGPSNO FIX	PGPSNO FIX	
PS No.	PSNO h	PSNO h	

3.6 TX tester command

(1) Setup TX Meas Parameter

Function	MT8801	MT8820A	Note
Measurement Trigger			
UW	MEASTRG UW	MEASTRG UW	
Video	MEASTRG VIDEO	MEASTRG VIDEO	
Unique Word Pattern			
No	PATT NO	-----	
User	PATT USER	PATT USER	
16 bits	PATT B16	PATT B16	
32 bits	PATT B32	PATT B32	
User Bit Pattern	HPATT h	HPATT h	
Start Point	STARTPT n	STARTPT n	
Pattern Length	PATTLN n	PATTLN n	
PS Slot			
On	PSSLOT ON	-----	
Off	PSSLOT OFF	-----	
User Cal Factor	UCAL level	DLEXTLOSS level ULEXTLOSS level	

(2) Modulation Analysis

Function	MT8801	MT8820A	Note
Bit Rate Measurement			
On	BRMEAS ON	BRM_MEAS ON	
Off	BRMEAS OFF	BRM_MEAS OFF	
10 Burst Average On	BSTAVG ON	BRM_COUNT 10	*1
10 Burst Average Off	BSTAVG OFF	BRM_COUNT 1	*1
Adjust Range	ADJRNG	-----	*2
Calibration	PWRCAL CALVAL level	BANDCAL FULLCAL	*3
Calibration Cancel	CALCANCEL	-----	
Storage Mode			
Normal	STORAGE NORM	MOD_COUNT 1	
Average	STORAGE AVG	-----	MT8820A is able to perform Average measurement by setting the number of measurement ("MOD_MEAS"). *4
Average On	VAVG ON VAVG 1 KSG	-----	
Average Off	VAVG OFF VAVG 0 KSH	-----	
Average Count	AVR n VAVG n	MOD_COUNT n BRM_COUNT n	

Measurement Result Recall command

Function	MT8801	MT8820A	Note
Carrier Frequency	CARRF?	CARRF?	*5
Carrier Frequency Error	CARRFERR? CARRFERR? unit	CARRFERR? CARRFERR? unit	*6
RMS Vector Error	VECTERR?	VECTERR?	*6
First 10 Symbols RMS Vector Err	FVECTERR?	-----	
Peak Vector Error	PVECTERR?	PVECTERR?	*6
Magnitude Error	MAGTDERR?	MAGTDERR?	*6
Phase Error	PHASEERR?	PHASEERR?	*6
Origin Offset	ORGNOFS?	ORGNOFS?	*6
Droop Factor	DRPFACT?	DRPFACT?	*6
Bit Rate	BITR?	BITR?	*6
Bit Rate Error	BITRERR?	BITRERR?	*6
Peak Vector Error Symbol	PVECTSYM?	-----	
+Peak Magnitude Error	PMAGTDERR? +	MAX_MAGTDERR?	
+Peak Magnitude Error Symbol	PMAGTDSYM? +	-----	
-Peak Magnitude Error Symbol	PMAGTDERR? -	MIN_MAGTDERR?	
-Peak Magnitude Error Symbol	PMAGTDSYM? -	-----	
+Peak Phase Error	PPHASEERR? +	MAX_PPHASEERR?	
+Peak Phase Error Symbol	PPHASESYM? +	-----	
-Peak Phase Error	PPHASEERR? -	MIN_PPHASEERR?	
-Peak Phase Error Symbol	PPHASESYM? -	-----	
Multi Response	MODANALMEAS?	ALL_MEAS? MOD ALL_MEAS? BRM	*7

*1 : MT8820A is able to do similar setting by specifying Bit Rate Measurement On/Off and the number of measurement.

*2 : MT8820A does not equip this function for measurement speedup. Measurement should be performed with the Reference Level set to optimum input level. (Level setting can be performed faster than the use of Adjust Range function.)

*3 : Power Meter is not mounted in MT8820A. (Power Meter Calibration is not executable.) Above commands should be used for calibration.

*4 : MOD_COUNT sets the number of Modulation Analysis measurement, BRM_COUNT sets the number of Bit Rate Measurement.

MT8820A is able to perform Average measurement by setting Average Count to 2~9999 times.

*5 : Adding "AVG_" before the command recalls Average measurement result.

*6 : Adding "AVG_" before the command recalls Average, adding "MAX_" recalls Max. and adding "Min_" recalls Minimum measurement result.

*7 : Response message is different from that of MT8801. Please refer to MX882005A operation manual for detail.

(3) Waveform Display command

Not supported by MT8820A.

(4) RF Power command

Function	MT8801	MT8820A	Note
Window			
Slot	WINDOW SLOT	PWR_WIN SLOT	*1
Frame	WINDOW FRAME	PWR_WIN FRAME	*1
Leading	WINDOW LEAD WINDOW RISE	PWR_WIN LEAD	*1
Trailing	WINDOW TRAIL WINDOW FALL	PWR_WIN TRAIL	*1
Adjust Range	ADJRNG	-----	*2
Calibration	PWRCAL CALVAL level	BANDCAL FULLCAL	*3
Calibration Chancel	CALCHANCEL	-----	
Marker Mode			
On	MKR NRM	PWR_MKR ON	*1
Off	MKR OFF	PWR_MKR OFF	*1
Marker Position	MKRS r MKN r	PWR_MKRS r PWR_MKN r	*1
Marker Level	MKL?	PWR_MKL?	*1
Unit			
DBm	UNIT DBM	-----	*4
nW/uW/mW/W	UNIT WATT	-----	*4
Level			
Relative	LVLREL ON MTEMPREL ON	PWR_VSCALE REL	*1
Absolute	LVLREL OFF MTEMPREL OFF	PWR_VSCALE ABS	*1
Storage Mode			
Normal	STORAGE NRM	STORAGE CUR	
Max Hold	STORAGE MAX	STORAGE MAX	
Min Hold	STORAGE MIN	STORAGE MIN	
Average	STARAGE AVG	STARAGE AVG	
Average On	VAVG ON VAVG 1 KSG	-----	MT8820A is able to perform Average measurement by setting the number of measurement ("MOD_MEAS"). *5

Average Off	VAVG OFF VAVG 0 KSH	-----	
Cumulative	STORAGE CUM	-----	
Over Write	STORAGE OVER	-----	
Wide Dynamic Range	STORAGE WIDE	WDR_MEAS ON	
Average Count	AVR n VAVG n	PWR_COUNT n	
Recall Template	SLCTTEMP n RCLTEMP n	-----	
Select Template			
Standard	SLCTTEMP STD	TEMPSTD	
Off	SLCTTEMP OFF	-----	
Not Selected	-----	-----	

Measurement Result Recall command

Function	MT8801	MT8820A	Note
TX Power	TXPWR? TXPWR? unit	TXPWR? TXPWR? unit	*6 *7
Carrier Off Power	OFFPWR? OFFPWR? unit	OFFPWR? OFFPWR? unit	*6 *7
On / Off Ratio	RATIO?	RATIO?	*6 *7
Modulation Power	MODPWR? MODPWR? Unit	MODPWR? MODPWR? Unit	*6 *7
Timing	TIMING?	TIMING?	*6 *7
Jitter +	JITTER? +	MAX_JITTER?	
Jitter -	JITTER? -	MIN_JITTER?	
Template Pass / Fail (On Section)	TEMPPASS? ON	PWRTEMP?	*7 MT8820A Template Evaluation displays the result for specified evaluation zone. WDRTEMP? recalls the evaluation result of Wide Dynamic Range Power.
Template Pass / Fail (Off Section)	TEMPPASS? OFF		
Rising Time	RISETM?	RISETM?	*6 *7
Falling Time	FALLTM?	FALLTM?	*6 *7
Frame Mean Power	FMEANPWR? FMEANPWR? Unit	-----	
Slot Mean Power	SMEANPWR? SMEANPWR? Unit	-----	
Slot Power	SLOTPWR? N	-----	
Reference Power of Template	TEMPRPWR?	-----	
Multi Response	RFPWRMEAS?	ALLMEAS? PWR	*8

*1 : MT8820A has waveform display screens for Power Measurement and Wide Dynamic Range Power.

The waveform screen setting of Wide Dynamic Range Power can be changed by replacing "PWR_" with "WDR_".

*2 : MT8820A does not equip this function for measurement speedup. Measurement should be performed with the Reference Level set to optimum input level. (Level setting can be performed faster than the use of Adjust Range function.)

- *3 : Power Meter is not mounted in MT8820A. (Power Meter Calibration is not executable.)
Above commands should be used for calibration.
- *4 : MT8820A is able to specify the unit when recalling each measurement value. (dBm, Watt)
- *5 : PWR_ COUNT sets the number of Power measurement.
MT8820A is able to perform Average measurement by setting Average Count to 2~9999 times.
Also,MT8820A has the waveform display screen for Power Measurement and Wide Dynamic Range Power.
- *6 : Adding "W" before the command recalls Wide Dynamic Range Power measurement result.
- *7 : Adding "AVG_" before the command recalls Average, "MAX_" recalls Max. and "Min_" recalls Minimum measurement result.
- *8 : Response message is different from that of MT8801. Please refer to MX882005A operation manual for detail.

(5) Setup Template command

Function	MT8801	MT8820A	Note
Save Template	SAVETEMP n	-----	
Off Level			
dBm	OFFLVL DBM	OFFLVL DBM	
dB	OFFLVL DB	OFFLVL DB	
Level Modify (Line Level)			
Limit - 1 (Line 1)	TEMPLVL 1, level	TEMPLVL 1, level	
Limit - 2 (Line 2)	TEMPLVL 2, level	TEMPLVL 2, level	
Limit - 3 (Line 3)	TEMPLVL 3, level	TEMPLVL 3, level	

(6) Occupied Bandwidth command

Function	MT8801	MT8820A	Note
Adjust Range	ADJRNG	-----	*1
Calibration	PWRCAL CALVAL level	BANDCAL FULLCAL	*2
Calibration Chancel	CALCHANCEL	-----	
Measure Method			MT8820A supports High Speed mode only.
Spectrum	MEAS OBW,SPECT MEAS OBW,STD	-----	
High Speed	MEAS OBW,HIGH	-----	
Occupied Bandwidth Ratio	-----	OBW_RATIO per	
Storage Mode			
Normal	STORAGE NORM	OBW_COUNT 1	
Average	STORAGE AVG	-----	
Average On	VAVG ON VAVG 1 KSG	-----	MT8820A is able to perform Average measurement by setting the number of measurement ("OBW_MEAS").
Average Off	VAVG OFF VAVG 0 KSH	-----	*3
Average Count	AVR n VAVG n	OBW_COUNT n	

Measurement Result Recall command

Function	MT8801	MT8820A	Note
Occupied Bandwidth	OCCBW? OBW?	OCCBW? OBW?	
Center Frequency	OBWFREQ? CENTER	OBWFREQ? CENTER	
Lower	OBWFREQ? LOWER OBWFREQ? -	OBWFREQ? LOWER OBWFREQ? -	
Upper	OBWFREQ? UPPER OBWFREQ? +	OBWFREQ? UPPER OBWFREQ? +	
Span width	FSPAN?	-----	
Multi Response	OBWMEAS?	ALLMEAS? OBW	*4

*1 : MT8820A does not equip this function for measurement speedup. Measurement should be performed with the Reference Level set to optimum input level. (Level setting can be performed faster than the use of Adjust Range function.)

*2 : Power Meter is not mounted in MT8820A. (Power Meter Calibration is not executable.) Above commands should be used for calibration.

*3 : OBW_COUNT sets the number of Occupied Bandwidth measurement.

MT8820A is able to perform Average measurement by setting Average Count to 2~9999 times.

*4 : Response message is different from that of MT8801. Please refer to MX882005A operation manual for detail.

(7) Adjacent Channel Power command

Function	MT8801	MT8820A	Note
Adjust Range	ADJRNG	-----	*1
Calibration	PWRCAL CALVAL level	BANDCAL FULLCAL	*2
Calibration Chancel	CALCHANCEL	-----	
Measure Method			MT8820A supports High Speed mode only.
Spectrum (All)	MEAS ADJ,SPECT1 MEAS ADJ,SPECT MEAS ADJ,STD MEAS ADJ,STD1	-----	
Spectrum (Separate)	MEAS ADJ,SPECT2 MEAS ADJ,STD2	-----	
High Speed	MEAS ADJ,HIGH	-----	
Unit			
DBm	UNIT DBM	-----	*3
MW	UNIT MW	-----	*3
UW	UNIT UW	-----	*3
NW	UNIT NW	-----	*3
DB	UNIT DB	-----	*3
Storage Mode			
Normal	STORAGE NORM	ADJ_COUNT 1	
Average	STORAGE AVG	-----	MT8820A is able to perform Average measurement by setting the number of measurement ("ADJ_MEAS").
Average On	VAVG ON VAVG 1 KSG	-----	*4
Average Off	VAVG OFF VAVG 0 KSH	-----	
Average Count	AVR n VAVG n	ADJ_COUNT n	
Maker			
Meas On	ADJMEAS ON	ADJ_MEAS ON	
Meas Off	ADJMEAS OFF	ADJ_MEAS OFF	
Marker Position			Markers and waveforms will be supported in the future.
Point	MKP p	-----	

Frequency	MKR freq MKN freq	-----
Marker Level	MKL?	-----

Measurement Result Recall command

Function	MT8801	MT8820A	Note
Adjacent Channel Power	ADJCH? ps ADJCH? ps,unit	ADJCH? ps ADJCH? ps,unit	*5 ps : LOW2, LOW1, UP1,UP2
Span Width	FSPAN?	-----	
Signal Power	SPWR?	-----	
Multi Response	ACPMEAS?	ALLMEAS? ADJ	*6

*1 : MT8820A does not equip this function for measurement speedup. Measurement should be performed with the Reference Level set to optimum input level. (Level setting can be performed faster than the use of Adjust Range function.)

*2 : Power Meter is not mounted in MT8820A. (Power Meter Calibration is not executable.) Above commands should be used for calibration.

*3 : MT8820A is able to specify the unit when recalling each measurement value. (dB, dBm,Watt)

*4 : MT8820A is able to perform Average measurement by setting Average Count to 2~9999 times.

*5 : Adding "AVG_" before the command recalls Average measurement result.

*6 : Adding "AVG_" before the command recalls Average, adding "MAX_" recalls Max. and adding "Min_" recalls Minimum measurement result.

*6 : Response message is different from that of MT8801. Please refer to MX882005A operation manual for detail.

(8) Power Meter command

Not supported by MT8820A.

(9) Select TX All Measure Item command

Function	MT8801	MT8820A	Note
10 Burst Average			
On	MBSTAVG ON	BRM_COUNT 10	*1
Off	MBSTAVG OFF	BRM_COUNT 1	*1
Frequency			
On	MCARRF ON	MOD_MEAS ON	*2
Off	MCARRF OFF	MOD_MEAS OFF	*2
Frequency Error Measurement			
On	MCARRFERR ON	MOD_MEAS ON	*2
Off	MCARRFERR OFF	MOD_MEAS OFF	*2
Frequency Error Unit			
kHz	UCARRFERR KHZ	-----	*3
ppm	UCARRFERR PPM	-----	*3
Frequency Error Judge			
On	JCARRFERR ON	-----	*4
Off	JCARRFERR OFF	-----	*4
Frequency Error Limit Upper Limit	ULCARRFERR freq	-----	*4
RMS Vector Error Measurement			
On	MVECTERR ON	MOD_MEAS ON	*2
Off	MVECTERR OFF	MOD_MEAS OFF	*2
RMS Vector Error			

Judge			
On	JVECTERR ON	-----	*4
Off	JVECTERR OFF	-----	*4
RMS Vector Error Limit	ULVECTERR r	-----	*4
Peak Vector Error Measurement			
On	MPVECTERR ON	MOD_MEAS ON	*2
Off	MPVECTERR OFF	MOD_MEAS OFF	*2
Peak Vector Error Judge			
On	JPVECTERR ON	-----	*4
Off	JPVECTERR OFF	-----	*4
Peak Vector Error Limit	ULPVECTERR r	-----	*4
Magnitude Error Measurement			
On	MMAGTDERR ON	MOD_MEAS ON	*2
Off	MMAGTDERR OFF	MOD_MEAS OFF	*2
Magnitude Error Judge			
On	JMAGTDERR ON	-----	*4
Off	JMAGTDERR OFF	-----	*4
Magnitude Error Limit	ULMAGTDERR r	-----	*4
Phase Error Measurement			
On	MPHASEERR ON	MOD_MEAS ON	*2
Off	MPHASEERR OFF	MOD_MEAS OFF	*2
Phase Error Judge			
On	JPHASEERR ON	-----	*4
Off	JPHASEERR OFF	-----	*4
Phase Error Limit	ULPHASEERR r	-----	*4
Origin Offset Measurement			
On	MORGNOfS ON	MOD_MEAS ON	*2
Off	MORGNOfS OFF	MOD_MEAS OFF	*2
Bit Rate Error Measurement			
On	MBITRERR ON	BRM_MEAS ON	*5
Off	MBITRERR OFF	BRM_MEAS OFF	*5
Bit Rate Error Judge			
On	JBITRERR ON	-----	*4
Off	JBITRERR OFF	-----	*4
Bit Rate Error Limit	ULBITRERR r	-----	*4
TX Power Measurement			
On	MTXPWR ON	PWR_MEAS ON	*6
Off	MTXPWR OFF	PWR_MEAS OFF	*6
TX Power Unit			
dBm	UTXPWR DBM	-----	*7
Watt	UTXPWR WATT	-----	*7
TX Power Judge			
On	JTXPWR ON	-----	*4
Off	JTXPWR OFF	-----	*4
TX Power Limit			
Lower Limit	LLTXPWR level	-----	*4
Upper Limit	ULTXPWR level	-----	*4
Carrier Off Power Measurement			
On	MOFFPWR ON	PWR_MEAS ON	*6
Off	MOFFPWR OFF	PWR_MEAS OFF	*6
Carrier Off Power Unit			
dBm	UOFFPWR DBM	-----	*3

Watt	UOFFPWR WATT	-----	*3
Carrier Off Power Judge			
On	JOFFPWR ON	-----	*4
Off	JOFFPWR OFF	-----	*4
Carrier Off Power Upper Limit	UOFFPWR level	-----	*4
On / Off Ratio Measurement			
On	MRATIO ON	PWR_MEAS ON	*6
Off	MRATIO OFF	PWR_MEAS OFF	*6
On / Off Ratio Judge			
On	JRATIO ON	-----	*4
Off	JRATIO OFF	-----	*4
On / Off Ratio Lower Limit	LLRATIO level	-----	*4
Modulation Power Measurement			
On	MMDPWR ON	PWR_MEAS ON	*6
Off	MMDPWR OFF	PWR_MEAS OFF	*6
Modulation Power Unit			
dBm	UMODPWR DBM	-----	*7
Watt	UMODPWR WATT	-----	*7
Modulation Power Judge			
On	JMDPWR ON	-----	*4
Off	JMDPWR OFF	-----	*4
Modulation Power Limit			
Lower Limit	LLMDPWR level	-----	*4
Upper Limit	ULMDPWR level	-----	*4
Burst Timing Measurement			
On	MBSTTIMNG ON	PWR_MEAS ON	*6
Off	MBSTTIMNG OFF	PWR_MEAS OFF	*6
Burst Timing Judge			
On	JBSTTIMING ON	-----	*4
		--	
Off	JBSTTIMING OFF	-----	*4
		--	
Burst Timing Limit			
Lower Limit	LLBSTTIMING f	-----	*4
		--	
Upper Limit	ULBSTTIMING f	-----	*4
		--	
Rising Time Measurement			
On	MRISETM ON	PWR_MEAS ON	*6
Off	MRISETM OFF	PWR_MEAS OFF	*6
Rising Time Judge			
On	JRISETM ON	-----	*4
Off	JRISETM OFF	-----	*4
Rising Time Limit			
Lower Limit	LLRISETM r	-----	*4
Upper Limit	ULRISETM r	-----	*4
Falling Time Measurement			
On	MFALLTM ON	PWR_MEAS ON	*6
Off	MFALLTM OFF	PWR_MEAS OFF	*6
Falling Time Judge			
On	JFALLTM ON	-----	*4
Off	JFALLTM OFF	-----	*4
Falling Time Limit			

Lower Limit	LLFALLTM r	-----	*4
Upper Limit	ULFALLTM r	-----	*4
Template Pass / Fail			
On	MTEMPPASS ON	PWR_MEAS ON	*6
Off	MTEMPPASS OFF	PWR_MEAS OFF PWR_TEMPPOS NONE	*6
Template Pass / Fail Zone			
On Only	LTEMPPASS ON	PWR_TEMPPOS ON	*4
On & Off	LTEMPPASS BOTH	PWR_TEMPPOS BOTH	*4
Off Only	-----	PWR_TEMPPOS OFF	*4

Function	MT8801	MT8820A	Note
Occupied Bandwidth Method			
Spectrum	AMEAS OBW,SPECT	-----	
High Speed	AMEAS OBW,HIGH	-----	
Occupied Bandwidth Measurement			
On	MOCCBW ON	OBW_MEAS ON	*8
Off	MOCCBW OFF	OBW_MEAS OFF	*8
Occupied Bandwidth Judge			
On	JOCCBW ON	-----	*4
Off	JOCCBW OFF	-----	*4
Occupied Bandwidth Upper Limit	ULOCCBW freq	-----	*4
Lower Measurement			
On	MOBWFREQ LOW,ON	OBW_MEAS ON	*8
Off	MOBWFREQ LOW,OFF	OBW_MEAS OFF	*8
Lower Judge			
On	JOBWFREQ LOW,ON	-----	*4
Off	JOBWFREQ LOW,OFF	-----	*4
Lower Limit	LLOBWFREQ LOW,freq	-----	*4
Upper Measurement			
On	MOBWFREQ UP,ON	OBW_MEAS ON	*8
Off	MOBWFREQ UP,OFF	OBW_MEAS OFF	*8
Upper Judge			
On	JOBWFREQ UP,ON	-----	*4
Off	JOBWFREQ UP,OFF	-----	*4
Upper Limit	ULOBWFREQ UP,freq	-----	*4
Adjacent Channel Power Method			
Spectrum(All)	AMEAS ADJ,SPECT1	-----	
Spectrum(Separate)	AMEAS ADJ,SPECT2	-----	
High Speed	AMEAS ADJ,HIGH	-----	
Adjacent Channel Power Measurement			
On	MADJCH ps,ON	ADJ_MEAS ON	*9
Off	MADJCH ps,OFF	ADJ_MEAS OFF	*9
Adjacent Channel Power Unit			
dBm	UADJCH ps,DBM	-----	*10
dB	UADJCH ps,DB	-----	*10
mW	UADJCH ps,MW	-----	*10
uW	UADJCH ps,UW	-----	*10
nW	UADJCH ps,NW	-----	*10
Adjacent Channel Judge			
On	JADJCH ps,ON	-----	*4
Off	JADJCH ps,OFF	-----	*4

ULADJCH ps,level	ULADJCH ps,level	-----	*4
Standard setting	AITEM STD	-----	

*1 : MT8820A is able to do similar setting by specifying Bit Rate Measurement On/Off and the number of measurement.

*2 : Measurement is started by setting Modulation Analysis measurement to On.

*3 : MT8820A is able to specify the unit when recalling each measurement value. (kHz,ppm)

*4 : Judge function will be supported in the future.

*5 : Measurement starts by setting Bit Rate Measurement to On.

*6 : Measurement starts by setting Power Measurement to On.

*7 : MT8820A is able to specify the unit when recalling each measurement value. (dBm,Watt)

*8 : Measurement starts by setting Occupied Bandwidth Measurement to On.

*9 : Measurement starts by setting Adjacent Channel Power Measurement to On.

*10 : MT8820A is able to specify the unit when recalling each measurement value. (dB,dBm,Watt)

(10) Tx All Measure command

Function	MT8801	MT8820A	Note
Adjust Range	ADJRNG	-----	*1
Calibration	PWRCAL CALVAL level	BANDCAL FULLCAL	*2
Calibration Chancel	CALCHANCEL	-----	
Storage Mode			
Normal	STORAGE NORM	-----	
Wide Dynamic Range Power	STORAGE WIDE	WDR_MEAS ON	*3
Average	STORAGE AVG	-----	MT8820A is able to perform Average measurement by setting the number of measurement. *4
Average On	VAVG ON VAVG 1 KSG	-----	
Average Off	VAVG OFF VAVG 0 KSH	-----	
Average Count	AVR n VAVG n	ADJ_COUNT n	

Measurement Result Recall command (Evaluation, Multi Response)

Function	MT8801	MT8820A	Note
Carrier Frequency Error	JCARRFERR?	-----	*5
RMS Vector Error	JVECTERR?	-----	*5
Peak Vector Error	JPVECTERR?	-----	*5
Magnitude Error	JMAGTDERR?	-----	*5
Phase Error	JPHASEERR?	-----	*5
Origin Offset	JORGNOSFS?	-----	*5
Bit Rate Error	JBITRERR?	-----	*5
TX Power	JTXPWR?	-----	*5
Carrier Off Power	JOFFPWR?	-----	*5
On / Off Ratio	JRATIO?	-----	*5
Modulation Power	JMODPWR?	-----	*5
Burst Timing	JBSTTIMING?	-----	*5
Rising Time	JRISETM?	-----	*5
Falling Time	JFALLTM?	-----	*5
Template	TEMPPASS?	PWRTEMP?	*6
Occupied Bandwidth	JOCCBW?	-----	*5
Lower Frequency	JOBWFREQ? L	-----	*5
Upper Frequency	JOBWFREQ? U	-----	*5
Adjacent Channel	JADJCH? ps	-----	*5

Power			
Total Judgement	JTOTAL?	-----	*5
Multi Response	ALLMEAS? a	ALLMEAS? a	*7

*1 : MT8820A does not equip this function for measurement speedup. Measurement should be performed with the Reference Level set to optimum input level. (Level setting can be performed faster than the use of Adjust Range function.)

*2 : Power Meter is not mounted in MT8820A. (Power Meter Calibration is not executable.) Above commands should be used for calibration.

*3 : MT8820A has waveform display screens for Power Measurement and Wide Dynamic Range Power.

*4 : MT8820A is able to perform Average measurement by setting Average Count to 2~9999 times.

*5 : Judge function will be supported in the future.

*6 : In MT8820A, "WDRTEMP?" recalls the Template evaluation result of Wide Dynamic Range Power.

*7 : In MT8820A, "ALLMEAS?" recalls all measurement results. Also, response message is different from that of MT8801. Please refer to MX882005A operation manual for detail.

3.7 RX Tester command

(1) Setup RX Measure Parameter command

Function	MT8801	MT8820A	Note
Burst Trigger Source			
Internal	BTG INT	BTG INT	
External	BTG EXT	BTG EXT	*1
Burst Trigger Input Polarity			
Rise	BTI RISE	BTI RISE	*1
Fall	BTI FALL	BTI FALL	*1
Burst Trigger Output Polarity			
Rise	BTO RISE	BTO RISE	
Fall	BTO FALL	BTO FALL	
Burst Trigger Position			
CS	TGS CS TGS DN	TGS CS TGS DN	
PS	TGS PS TGS UP	TGS PS TGS UP	
Input Data			
Positive	EIBD POS	EIBD POS	
Negative	EIBD NEG	EIBD NEG	
Input Data Clock			
Rise	EIBC RISE	EIBC RISE	
Fall	EIBC FALL	EIBC FALL	
Pattern (Continuous)			
PN9	PAT PN9	PAT PN9	
PN15	PAT PN15	PAT PN15	
Bit	PAT bit	PAT bit	
TCH : SA	SA h	-----	
TCH : TCH			
PN9	TCH PN9	TCH PN9 TESTPAT PN9	
PN15	TCH PN15	TCH PN15 TESTPAT PN15	
Echo Back	TCH ECHO	TCH ECHO TESTPAT ECHO	
TCH : Secret Scramble			
On	SCRT ON	SCRT ON	
Off	SCRT OFF	SCRT OFF	

TCH : Secret Code	SCRTC h	SCRTC h	
SYNC :CI	CI h	-----	
SYNC : CS-ID	CSID h	CSID h	
SYNC : PS-ID	PSID h	PSID h	
SYNC : Idle	IDLE h	-----	
TCH,SYNC : Scramble (CS-ID Scramble)			
On	SCBL ON	SCBL ON	
Off	SCBL OFF	SCBL OFF	
TCH , SYNC : Scramble Code (CS-ID Scramble Code)			
Slot No.	SCBLC h	SCBLC h	
Recall Pattern	RCLPATT n	-----	*2
Save Pattern	SAVEPATT n	-----	*2

Function	MT8801	MT8820A	Note
Differential Phase Encode			
Normal	DPE NORM	DPE NORM	
Invert	DPE INVS	DPE INVS	

*1 : Not available at present, to be supported in the beginning of October.

*2 : Supported by parameter save/recall commands.

(2) BER Measure command

Function	MT8801	MT8820A	Note
Frequency	RFREQ freq FR freq FC freq	RFREQ freq RXFREQ freq DLFREQ freq	
Channel	CHAN ch	CHAN ch	
Frequency Incremental Step			
Value	FIS freq	-----	
Up	FRS UP UFR	-----	
Down	FRS DN DFR	-----	
Frequency Relative Reference Value	FRLR?	-----	
Value	FRLV?	-----	
On	FRL ON FO	-----	
Off	FRL OFF FF	-----	
Output Level	OLVL level OL level AP level	OLVL level SGLVL level	
Output Level Incremental Step			
Value	OLS level	-----	
Up	OLS UP UOL	-----	
Down	OLS DN DOL	-----	
Knob			
Step Up	OLK UP TOL	-----	
Step Down	OLK DN EOL	-----	
Output Level Resolution	OLR level	-----	

Level Relative			
Reference Value	ORLR?	-----	
Value	ORLV?	-----	
On	ORL ON LO	-----	
Off	ORL OFF LF	-----	

Function	MT8801	MT8820A	Note
Output Level Offset			
Value	OOS level	-----	
On	OOF ON	-----	
Off	OOF OFF	-----	
Output Level On / Off			
On	LVL ON RO	LVL ON	
Off	LVL OFF RF	LVL OFF	
Voltage Display			
EMF	VDSPL EMF SP03	VDSPL EMF	
TERM	VDSPL TERM SP04	VDSPL TERM	
Level Continuous Mode			
On	OCNT ON	LVLCONT ON	
Off	OCNT OFF	LVLCONT OFF	
Unit			
dBm	OLDBM OLDM APDBM APDB	-----	
dBu	OLDBU OLDU APDBU APDU	-----	
Calibration	CAL	BANDCAL FULCAL	
Modulation			
On	MOD ON	MOD ON	
Off	MOD OFF	MOD OFF	
Bit Error Rate Measurement			
Start	BERSA	-----	*2
Stop	BERSO	-----	

*1 : In MT8820A , "BER_SAMPLE n" specifies the number of bits to be measured.

*2 : MT8820A is able to perform measurement by Single or Continuous measurement in Bit Error Rate Measurement On.

Measurement Result Recall command

Function	MT8801	MT8820A	Note
Error Rate	BERRATE?	BERRATE?	
Error Count	BERCNT?	BERCNT?	
Multi Response	BERMEAS?	ALLMEAS? BER	*3

*3 : Response message is different from that of MT8801. Please refer to MX882005A operation manual for detail.

4 Remote programming differences between MT8801C and MT8820A

MT8820A eliminates dependence on screens so that remote control for setting and measurement can be simplified in order to shorten total time from setting to measurement. It is recommended to control MT8820A appropriately although it is possible to perform remote control of MT8820A similarly to MT8801A.

4.1 About screen change and setting

Unlike MT8801C, MT8820A is able to perform setting on any screen. Also, the setting can be confirmed on any screen.

Ex. Setting of Measurement Trigger to "Unique Word"

[Programming sample (MT8801C)]

```
write_gpib(MT8801C,"MEAS TXITEM"); // Issue of screen change command
do{
    write_gpib(MT8801C, "MEAS?"); // Confirmation of currently
displayed screen
    current_screen = read_gpib(MT8801C);
} while(current_screen == "TXITEM");
write_gpib(MT8801C, "MEASTRG UW"); // Requested setting
```

[Programming sample (MT8820A)]

```
write_gpib(MT8820A, "MEASTRG UW"); // Requested setting
```

4.2 About screen change and measurement

Unlike MT8801C, MT8820A is able to execute requested measurement and recall the result on any screen.

Ex. Measurement execution and result acquirement of adjacent channel power and Tx power with changed slot number

[Programming sample (MT8801C)]

```
write_gpib(MT8801C,"MEAS ADJ,HIGH"); // Issue of screen change command
do{
    write_gpib(MT8801C, "MEAS?"); // Confirmation of currently
displayed screen
    current_screen = read_gpib(MT8801C);
} while(current_screen == "ADJ,HIGH");
write_gpib(MT8801C, "SWP"); // Meas. start command
write_gpib(MT8801C, "ADJCH? LOW1"); // Meas. result recall command
AdjLower1Power = read_gpib(MT8801C); // Meas. result recall

write_gpib(MT8801C,"MEAS SETCOM"); // Issue of screen change command
do{
    write_gpib(MT8801C, "MEAS?"); // Confirmation of currently
displayed screen
    current_screen = read_gpib(MT8801C);
} while(current_screen == "SETCOM");
write_gpib(MT8801C, "SLTNUM 3 "); // Requested setting

write_gpib(MT8801C,"MEAS RFPWR"); / / Issue of screen change command
do{
    write_gpib(MT8801C, "MEAS?"); // Confirmation of currently
displayed screen
    current_screen = read_gpib(MT8801C);
} while(current_screen == "RFPWR");
write_gpib(MT8801C, "SWP"); // Meas. start command
write_gpib(MT8801C, "TXPWR?"); // Meas. result recall command
TxPowerResult = read_gpib(MT8801C); // Meas. result recall
```

[Programming sample (MT8820A)]

```
write_gpib(MT8820A, "SWP"); // Meas. start command
write_gpib(MT8820A, "ADJCH? LOW1"); // Meas. result recall command
AdjLower1Power = read_gpib(MT8820A); // Meas. result recall
write_gpib(MT8820A, "SLTNUM 3 "); // Requested setting
write_gpib(MT8820A, "SWP"); // Meas. start command
write_gpib(MT8820A, "TXPWR?"); // Meas. result recall command
TxPowerResult = read_gpib(MT8820A); // Meas. result recall
```

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Specifications are subject to change without notice.

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