

SUBMISSION OF MODIFIED COMPUTING DEVICES AND PERIPHERALS

On August 17, 1988, a public notice was issued by the Commission concerning submission of modified computing devices and peripherals in connection with applications for certification.

The Commission's Laboratory dismissed applications for computing devices filed by Toshiba Corporation, Heath Company, Well Join Ind Co., Inc., Everex Systems, Inc., and Genstar Systems, Inc. As part of its pre-grant sampling program, the companies were requested to submit samples of personal computers (and associated peripheral devices) that were the subject of applications for equipment authorization. Examination of the equipment submitted in each case revealed that the computers and/or peripheral devices had been modified.

Applications for certification must contain the information and documentation required by Sections 2.909, 15.34, 15.45 and 15.46 of the Rules. Without documentation, unnecessary burdens are placed on the Laboratory staff and questions may arise concerning the application for certification. A sample of a device submitted for testing must not differ from the device described in the application.

Computers must be tested with associated peripheral devices. Unless they are intended to be marketed as part of the computer system, peripherals used to test personal computers for compliance with the rules must themselves be certified. In a public notice dated September 18, 1986, the Commission stated that, "applications for certification of a personal computer or peripheral must show that it has been tested with the accessories with which it is normally going to be used." The use of a modified device to provide the Commission with test data is misleading and calls into question the validity of the application.

The discovery of undocumented modifications or modifications to previously certificated devices by staff during the pre-grant sampling of computing devices will result in dismissal of the application. In addition, the Commission may retain the equipment pending further investigation and appropriate enforcement action.

For further information, please contact Phillip Inglis at (301) 725-1585.

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PROPOSAL TO REVISE MP-4 (FCC COMPUTING DEVICE TEST PROCEDURE)

On March 7, 1989, the Commission released a Notice of Proposed Rulemaking (NPRM) in General Docket 89-44, (FCC 89-53) to revise MP-4, the FCC's procedure for testing computing devices.

Copies of the NPRM, which contains the proposed test procedure, may be obtained from the Commission's duplicating contractor, International Transcription Services, 2100 M Street, N.W., Suite 140, Washington, DC 20037, (202) 857-3800.

Inquiries concerning the NPRM may be directed to Richard Fabina at (301) 725-1585.

Note: The time to file comments and reply comments in the above NPRM has been extended until June 7 and July 7, 1989, respectively.  
See ORDER EXTENDING TIME TO FILE COMMENTS released April 26, 1989.

4/19/89

On February 8, 1990, the Commission issued a public notice, No. 1712, permitting ferrite beads on computer video cables as special accessories for compliance with Part 15, under certain conditions. The text of the notice follows:

Digital devices, such as personal computers, are required to meet radio noise suppression limits in Part 15 of the Commission's Rules, 47 CFR Part 15. Under these rules, digital devices must be capable of compliance in the configuration in which the equipment is marketed. The rules also permit compliance to be achieved through use of special accessories, such as shielded cables and/or special connectors, provided those special accessories are marketed with the equipment. Ref. 47 CFR Section 15.27. In response to a recent request for interpretation of the rules, it was found permissible to supply the purchaser with ferrite beads for use with off-the-shelf video monitor cables for Class B personal computers instead of supplying ferrite loaded cables.

The Commission has in the past certificated Class B personal computers and video interface cards with the condition that a ferrite loaded video cable be supplied where such a cable is needed to meet the radio noise suppression limits. However, video monitors are generally provided with their own cable. This results in waste and inefficiency because the user cannot employ two monitor cables. Moreover, since the monitor-supplied cable often is non-detachable, it is not possible to use the computer-supplied ferrite loaded

cable. This calls into doubt whether the computer as configured by the end user will still satisfy the FCC emissions limits.

As a solution to this situation, the Commission will permit ferrite beads to be supplied with host computers or video interface cards instead of ferrite loaded video cables, subject to the following conditions. First, a showing must be made that the computer complies with the rules when connected to an off-the-shelf video monitor. Second, the user must be provided with a clear set of instructions showing how to attach the ferrite beads to the video monitor cable. Third, the instructions must state prominently that the computer will not be in compliance with FCC Regulations unless the ferrites are attached to the video cable.

This policy does not extend to cables used for connecting the host computer to other peripherals and accessories. Unlike video monitors, peripherals such as printers and external modems do not come with cables. Thus, ferrite loaded cables supplied to the user for connecting these devices will not be superfluous. Further, while video monitor cables generally have the same physical and technical characteristics, this is not generally the case for other peripheral cables. Thus, ferrite provided to the user for other cables may not fit properly and therefore may not provide sufficient radio noise suppression. Finally, because a video monitor must be connected at the time of initial set-up in order to use the computer, it is reasonable to assume the user will follow the instructions and add the ferrites to the video cable. However, other peripheral equipment and accessories, such as joysticks and mice, are not necessary to operate the computer and may not be added until some time later. There is substantial doubt that the user will have retained the ferrites and will remember to add them.

While a ferrite-loaded cable is an effective means of limiting radio noise, it represents a band-aid approach to the problem. Good engineering design of computers and peripherals can avoid the need for such special equipment. Manufacturers are encouraged to employ techniques internal to the computer or other digital device, such as filtering and careful circuit board design, to prevent radio noise from being coupled onto connecting cable.

Questions concerning this notice should be directed to the Technical Standards Branch, (202) 653-6288.

REVISION OF PART 15 OF THE RULES REGARDING OPERATION OF RF DEVICES WITHOUT  
INDIVIDUAL LICENSE, GEN DOC 87-389

On April 4, 1990, the Commission released a public notice, No. DA 90-500, requesting comments on the technical rules adopted for field disturbance sensors.

The text of the notice follows:

The FCC recently adopted rules reducing the harmonic emission limit for filed disturbance sensors (FDS) to 0.5 mV/m in certain restricted frequency bands. General Motors Research Corp (GM) and M/A Com, both FDS manufacturers, filed petitions requesting reconsideration of these reductions. On March 19, 1990, the United States Department of Commerce, National Telecommunications and Information Administration (NTIA), filed a proposal for responding to these petitions.

NTIA suggests that the limit on harmonic emissions from FDS's designed for use inside buildings be relaxed to 25 mV/m. This value is comparable to the old limit. NTIA proposes that the harmonic emission limit for FDS's used outside buildings be relaxed to 7.5 mV/m. NTIA further suggests that FDS's used on mobile vehicles not be operated in a continuous mode.

Comments are requested on the NTIA proposal. Specific comments are requested regarding the proposal to prohibit FDS usage in motor vehicles on a continuous basis. NTIA has expressed concern that continuously-operated FDS's used on mobile vehicles are far more likely to cause interference than those which operate under limited circumstances, such as GM's Near Obstacle Detection System which operates only when a vehicle is in reverse gear. Comments are requested on how to define continuous operation and whether reasonable alternatives to this prohibition exist.

Comments on the NTIA proposal may be filed until May 4, 1990 with the Secretary, Federal Communications Commission, 1919 M Street, N.W., Washington, DC 20554, referencing the above docket number.

Copies of NTIA's proposal, as well as any documents filed in this matter, are available for public inspection and copying in the FCC Public Reference Room, 1919 M St., N.W., Room 230, Washington, DC and from the Commission's copy contractor, International Transcription Services, Inc., 2100 M St. N.W., Suite 140, Washington, DC 20037, telephone (202) 857-3800.

For further information contact George Harenberg at (202) 653-7314.

TYPE ACCEPTED 406 MHz EPIRBS

In view of interest in 406 MHz EPIRBs, the following is a list of those type accepted by the Commission. Equipment is authorized by the FCC Identifier (FCC ID), and records are maintained by the FCC ID. Therefore, no data is available regarding model numbers, type numbers, etc. Addresses listed are

the last known address in the Commission's records.

| GRANTEE and FCC ID                                                                           | RULE PART | FREQUENCY (MHz) | GRANT DATE |
|----------------------------------------------------------------------------------------------|-----------|-----------------|------------|
| ACR Electronics Inc., 5757 Ravenwood Road, Ft. Lauderdale, FL 33313<br>B668L2ACR-RLB-23      | 80.1061   | 406.025         | 091189     |
| Clifton Precision, 750 West Sproul Road, Springfield, PA 19064-4084<br>HTV94800000           | 80.1061   | 406.025         | 031390     |
| Electronics Safety Device Inc., P.O. Box 1034, Manhasset, NY 11030<br>IAZ406EPIRB116         | 80.1061   | 406.025         | 010590     |
| Furuno USA Inc., 271 Harbor Way, P.O. Box 2343, S. San Francisco, CA 94083<br>ADBLK01        | 80.1061   | 406.025         | 091189     |
| Graseby Dynamics Ltd., Park Ave., Bushey, Watford Herfordshire, WD2 2BW England<br>ICD247350 | 80.1061   | 406.025         | 121989     |

On September 10, 1990, the Commission issued the following public notice (No. 4746).

#### CERTIFIED SPREAD SPECTRUM SYSTEMS

This public notice is issued in response to an increase in the number of inquiries concerning parties that have been issued grants of equipment authorization for spread spectrum systems under Part 15 of the Rules.

A spread spectrum system is defined in Section 2.1 of the Rules as, "an information bearing communications system in which: (1) Information is conveyed by modulation of a carrier by some conventional means, (2) the bandwidth is deliberately widened by means of a spreading function over that which would be needed to transmit the information alone". (In some spread spectrum systems, a portion of the information being conveyed by the system may be contained in the spreading function.)

Companies which have received grants of equipment authorization for spread spectrum systems under Part 15 of the Rules are listed below:

| FCC_ID/Grantee | Rule_Part | Freq_(MHz) | Equipment_Code | Grant_Date |
|----------------|-----------|------------|----------------|------------|
|----------------|-----------|------------|----------------|------------|

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|                                                                                        |    |         |     |        |
|----------------------------------------------------------------------------------------|----|---------|-----|--------|
| Agilis Corporation, 1390 Shorebird Way, Mountain View, CA 94043                        |    |         |     |        |
| HWB-21CSP                                                                              | 15 | 902-928 | DSS | 121889 |
| Gambatte Inc., 1438 Tullie Road, NE., Atlanta, GA 30329                                |    |         |     |        |
| HSW2SSM9SM8DF69                                                                        | 15 | 902-928 | DSS | 050989 |
| Life Point System Inc., 101 West Robert E. Lee Blvd., Suite 402, New Orleans, LA 70124 |    |         |     |        |
| HW5FXT514A                                                                             | 15 | 902-926 | DSS | 100289 |
| HW5XT514X10                                                                            | 15 | 902-926 | DSS | 072090 |
| Metricom Inc., 2605 Winchester Blvd., Campbell, CA 95008-5320                          |    |         |     |        |
| GNW101443000                                                                           | 15 | 902-928 | DSS | 031290 |
| NYNEX Corp., 500 Westchester Ave., White Plains, NY 10604                              |    |         |     |        |
| HTI2TZR000254151                                                                       | 15 | 902-928 | DSS | 071989 |
| HTI2TZR000254111                                                                       | 15 | 902-928 | DSS | 030290 |
| O'Neill Communications, Inc., 100 Thanet Circle, Suite 202, Princeton, NJ 08540        |    |         |     |        |
| HUI100                                                                                 | 15 | 902-928 | DSS | 070789 |
| Telesystems SLW Inc., 85 Scarsdale Rd., Suite 201, Don Mills, Ontario M3B 2R2 Canada   |    |         |     |        |
| G473IA010                                                                              | 15 | 902-928 | DSS | 042189 |
| G473IA130                                                                              | 15 | 902-928 | DSS | 020689 |
| G473IA450                                                                              | 15 | 902-928 | DSS | 061389 |
| G473IARN1B                                                                             | 15 | 902-928 | DSS | 081088 |
| X Cyte Inc., 1710 Stierlin Road, Mountain View, CA 94043                               |    |         |     |        |
| FNP42TRDE001                                                                           | 15 | 902-928 | DSS | 031689 |
| FNP42TRDE002                                                                           | 15 | 902-928 | DSS | 031689 |
| FNP42TRDM001                                                                           | 15 | 902-928 | DSS | 031689 |
| FNP42TRDM001                                                                           | 15 | 902-928 | DSS | 031689 |

All grants of equipment authorization issued by the Commission for equipment subject to certification and notification appear on a monthly public notice titled, Certification/Notification Actions. Identification of authorized spread spectrum systems listed on the public notice(s) may be determined by the equipment code, DSS.

Inquiries concerning this public notice may be directed to Federal Communications Commission, Office of Engineering and Technology, Authorization and Evaluation Division, 7435 Oakland Mills Road, Columbia, MD 21046, (301) 725-1585.

OBTAINING BULLETINS AND MEASUREMENT PROCEDURES

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A limited number of free copies of various documents originated by the Office of Engineering and Technology (OET) are available from FCC's Service & Supply Branch, (202) 632-7272, and Consumer Assistance Office (202) 632-7000. Bulletins may also be obtained at cost from the Commission's duplicating contractor, International Transcription Services (ITS), (202) 857-3800, Washington, DC, (717) 337-1433, Gettysburg, PA. Revision of bulletins and measurement/test procedures will be announced by public notice and will also appear on the PAL "Hotline".

## Office designators:

|                                    |                                   |
|------------------------------------|-----------------------------------|
| EA, Equipment Authorization Branch | TS, Technical Standards Branch    |
| EE, Engineering & Evaluation       | SM, Sampling & Measurement Branch |
| FL, Frequency Liaison Branch       | SE, Spectrum Engineering Div      |
| TB, Treaty Branch                  | PA, Propagation Analysis Branch   |

## BULLETINS

| NO. | DATE  | TITLE                                                                                                                             | ORIGINATING OFFICE |
|-----|-------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------|
| *19 |       | FCC Test Procedure for Wireless Microphones and Auditory Assistance Devices...                                                    | EA, (301) 725-1585 |
| 37  | 8/81  | Criteria To Be Met By Doppler Radars Operating in the 24.05-24.15 GHz Band                                                        | EA, (301) 725-1585 |
| *40 | 6/78  | FCC Measurement Procedure for a Microwave Field Disturbance Sensor                                                                | SM, (301) 725-1585 |
| 43  | 4/77  | Peak Envelope Power & Output Limiting in the Citizens Band Radio Service                                                          | EA, (301) 725-1585 |
| 45  | 10/78 | Measurement Procedures for Peak Effective Radiated Power (PERP) of Emergency Position Indicating Radiobeacon (EPIRB) Transmitters | SM, (301) 725-1585 |
| 53  | 7/83  | Compatibility Standards for 800 MHz Land Mobile Cellular Systems (may be subject to NPRM in future)                               | TS, (202) 653-6288 |
| 55  | 11/89 | Characteristics of Open Field Test Sites                                                                                          | SM, (301) 725-1585 |
| 56  | 6/83  | Questions & Answers about Biological Effects & Potential Hazards of Radiofrequency Radiation                                      | SE, (202) 632-7025 |

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|      |       |                                                                                                                                                             |                    |
|------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| 60   | 2/86  | Multichannel Television Sound<br>Transmission & Audio Processing<br>Requirements for the BTSC System                                                        | TS, (202) 653-6288 |
| *61  | 4/84  | FCC Equipment Authorization Program...                                                                                                                      | EA, (301) 725-1585 |
| 62   | 11/89 | Understanding the FCC Regulations<br>Concerning Computing Devices                                                                                           | TS, (202) 653-6288 |
| 63   | 9/84  | Understanding the FCC...Part 15 Reg<br>for Lower Power Transmitters<br>(to be updated due to Part 15 revision<br>in the First Report & Order in Doc 87-389) | TS, (202) 653-6288 |
| 64   | 6/85  | Voluntary Technical Standards for<br>Broadcast Transmitters and other<br>RF Devices                                                                         | TS, (202) 653-6288 |
| **65 | 10/85 | Evaluating Compliance with FCC<br>Specified Guidelines for Human Exposure<br>to Radiofrequency Radiation                                                    | SE, (202) 632-7025 |
| 66   | 10/86 | Treaties and Other Int'l Agreements<br>for Telecommunication                                                                                                | TB, (202) 853-8126 |
| 67   | 3/88  | Potential Interference from Opera-<br>tional Fixed Stations in the 72-76<br>MHz Band to Television Channels 4 and 5                                         | PA, (202) 632-7025 |

MEASUREMENT PROCEDURES (MP)

|       |       |                                                                                                                           |                    |
|-------|-------|---------------------------------------------------------------------------------------------------------------------------|--------------------|
| *MP-1 | 2/83  | FCC Methods of Measurements for<br>Determining Compliance of Radio Control<br>& Security Alarm Devices & Associated Rcvrs | SM, (301) 725-1585 |
| MP-2  | 10/86 | Measurement of UHF Noise Figures of<br>of Television Receivers                                                            | EE, (301) 725-1585 |
| *MP-3 | 1/85  | FCC Methods of Measurements of...<br>TV Interface Devices                                                                 | SM, (301) 725-1585 |
| MP-4  | 7/87  | FCC Procedure for Measuring RF<br>Emissions from Computing Devices                                                        | SM, (301) 725-1585 |

(revision in NPRM, Docket 89-44 released March 7, 1989, to be referred to as  
"FCC Procedure for Measuring Electromagnet Emissions from Digital Devices,

FCC/OET TP-5")

|                                                                                                                        |       |                                                                         |                    |
|------------------------------------------------------------------------------------------------------------------------|-------|-------------------------------------------------------------------------|--------------------|
| MP-5                                                                                                                   | 2/86  | FCC Methods of Measurements of Radio Noise Emissions from ISM Equipment | TS, (202) 653-6288 |
| MP-8                                                                                                                   | 12/84 | Measurement Procedures for Radio-telegraph Auto Alarms                  | EA, (301) 725-1585 |
| MP-9                                                                                                                   | 9/87  | FCC Procedure for Measuring Cable Television Switch Isolation           | SM, (301) 725-1585 |
| * Scheduled for update due to adoption of Report and Order in Docket 87-212 and First Report & Order in Docket 87-389. |       |                                                                         |                    |
| ** Current cost of bulletin is \$11.95 and is available from NTIS, (703) 4787-4650 or 1-800-336-4700.                  |       |                                                                         |                    |

#### TEST PROCEDURES (TP)

|      |      |                                                                                          |                    |
|------|------|------------------------------------------------------------------------------------------|--------------------|
| TP-1 | 1980 | Procedure for Type Approval of Marine Radars (to be revised to refer to Type Acceptance) | EA, (301) 725-1585 |
|------|------|------------------------------------------------------------------------------------------|--------------------|

#### REPORT AND ORDER (GEN DOC 89-354)

On July 9, 1990, the Commission released a REPORT AND ORDER (R&O) in Gen Docket 89-354 amending Parts 2 and 15 of its rules to facilitate greater flexibility in the design and use of low power, non-licensed spread spectrum systems. These rule changes provide clarification of the minimum operating characteristics for direct sequence and frequency hopping systems to qualify for operation under Part 15 rules and expand and refine the permissible operating characteristics for frequency hopping systems. The new rules will significantly increase the potential range of permissible designs for Part 15 spread spectrum systems and thereby broaden the opportunities for development and use of this important new technology.

The rule sections affected and the new/amended text are listed below:

1. Section 2.1(c) is amended by adding the following definition in alphabetical order to read as follows:

#### Section 2.1 Terms and definitions

Pseudorandom Sequence. A sequence of binary data which has some of the characteristics of a random sequence but also has some characteristics which are not random. It resembles a true random sequence in that the one bits

and zero bits of the sequence are distributed randomly throughout every length, N, of the sequence and the total numbers of the one and zero bits in that length are approximately equal. It is not a true random sequence, however, because it consists of a fixed number (or length) of coded bits which repeats itself exactly whenever that length is exceeded, and because it is generated by a fixed algorithm from some fixed initial state.

2. Section 2.1033 is amended by adding a new paragraph (b)(11) to read as follows:

Section 2.1033 Application for certification

(b) \*\*\*

(11) Applications for certification of direct sequence spread spectrum transmitters under Part 15 shall be accompanied by an exhibit demonstrating compliance with the processing gain provisions of Section 15.247(e) of this chapter. Applications for the certification of frequency hopping transmitters under Part 15 shall be accompanied by an exhibit describing compliance of the associated receiver or receivers with Section 15.247(a)(1) of this chapter.

3. Section 15.203 is amended by revising the fourth sentence to read as follows:

Section 15.203 Antenna requirements

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This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219 or 15.221.

4. Section 15.247 is amended by revising paragraphs (a)(1), (b) and (c) and by adding new paragraphs (d), (e) and (f) to read as follows:

Section 15.247 Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

(a) \*\*\*\*\*

(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudorandomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

(i) Frequency hopping systems operating in the 902-928 MHz band shall use at least 50 hopping frequencies. The maximum allowed 20 dB bandwidth of the

hopping channel is 500 kHz. The average time of occupancy on any frequency shall not be greater than 0.4 seconds with a 20 second period.

(ii) Frequency hopping systems operating in the 2400-2483.5 MHz and 5725-5850 MHz bands shall use at least 75 hopping frequencies. The maximum 20 dB bandwidth of the hopping channel is 1 MHz. The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

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(b) The maximum peak output power of the transmitter shall not exceed 1 Watt. If transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceed 6 dBi.

(c) In any 100 kHz bandwidth outside these frequency bands, the radio frequency power that is produced by the modulation products of the spreading sequence, the information sequence and the carrier frequency shall be either at least 20 dB below that in any 100 kHz bandwidth within the band that contains the highest level of the desired power or shall not exceed the general levels specified in Section 15.209(a), whichever results in the lesser attenuation. All other emissions outside these bands shall not exceed the general radiated emission limits specified in Section 15.209(a).

(d) For direct sequence systems, the transmitted power density averaged over any 1 second interval shall not be greater than 8 dBm in any 3 kHz bandwidth within these bands.

(e) The processing gain of a direct sequence system shall be at least 10 dB. The processing gain shall be determined from the ratio in dB of the signal to noise ratio with the system spreading code turned off and the signal to noise ratio with the system spreading code turned on, as measured at the demodulated output of the receiver.

(f) Hybrid systems that employ a combination of both direct sequence and frequency hopping modulation techniques shall achieve a processing gain of at least 17 dB from the combined techniques. The frequency hopping operation of the hybrid system, with the direct sequence operation turned off, shall have an average time of occupancy on any frequency not to exceed 0.4 seconds within a time period in seconds equal to the number of hopping frequencies employed multiplied by 0.4. The direct sequence operation of the hybrid system, with the frequency hopping operation turned off, shall comply with the power density requirements of paragraph (d) of this Section.

A very limited number of copies of the complete MO&O are available free of charge from the FCC, Equipment Authorization Branch, 7435 Oakland Mills Rd., Columbia, MD 21046, Attn: Ruby Moore. Upon exhaustion of this supply, copies of the R&O may be obtained for a small fee from the Commission's

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present duplicating contractor, ITS, 2100 M Street, N.W., Suite 140, Washington, DC 20006, (202) 857-3800, or one of the other distributors of FCC documents listed under Selection 4 of the main PAL menu (Other Commission Activities and Procedures).

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