

DYNAMIC SERVICE PROTECTION NO. 2 ELECTRONIC SWITCHING SYSTEM

CONTENTS	PAGE	CONTENTS	PAGE
<i>FEATURE DEFINITION AND DESCRIPTION</i>	3	12. COMPATIBILITY	6
1. DEFINITION	3	13. OFFICE DATA	6
2. DESCRIPTION	3	14. GROWTH/RETROFIT PROCEDURES	6
3. FEATURE FLOW DIAGRAM	4	15. TESTING	6
4. INTERACTIONS	4	<i>ADMINISTRATION</i>	6
<i>ATTRIBUTES</i>	4	16. MEASUREMENTS	6
5. STATION/SYSTEM	4	17. RECORD KEEPING	6
6. LIMITATIONS	4	18. CHARGING	6
7. RESTRICTION CAPABILITY	4	<i>AVAILABILITY</i>	6
8. COST DATA	4	19. NEW INSTALLATIONS	6
<i>INCORPORATION INTO SYSTEM</i>	4	20. GROWTH/RETROFIT	6
9. PLANNING	4	<i>SUPPLEMENTARY INFORMATION</i>	6
10. HARDWARE ENGINEERING	6	21. GLOSSARY	6
11. SOFTWARE ENGINEERING	6	22. REASONS FOR REISSUE	7
		23. REFERENCES	7

NOTICE

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FIGURES

PAGE

Fig. 1—Feature Flow Diagram Dynamic Service Protection	5
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FEATURE DEFINITION AND DESCRIPTION**1. DEFINITION**

1.01 Dynamic service protection (DSP) is a feature designed to protect certain lines with priority status from degraded service during extended overloads on the switching system by automatically giving preferential dial tone access to those lines during overload conditions. This feature is implemented by a teletypewriter (TTY) input message.

1.02 DSP is a standard feature in No. 2 Electronic Switching System (ESS) with either the LO-1 or EF-1 generic program.

2. DESCRIPTION**A. Customer (User) Perspective**

2.01 A customer line assigned as class A is given preferential treatment during line scanning and for connection to dial tone when DSP is activated by the system. DSP does not deny service to any line. It assures class A customers preferential service while serving all class B customers as rapidly as equipment becomes available. Class A customers are identified by terminal equipment numbers on the network. All lines not assigned as class A are considered to be class B.

B. System Implementation

2.02 If DSP is allowed, the system automatically administers DSP when an overload condition exists. An overload condition is determined by dial tone speed tests (DTST) which are performed every four seconds. Every 100 seconds the traffic program checks the DTST for the number of failures in the last 16 tests performed. A DTST failure results when a random customer selected by the traffic program for the DTST has failed to receive dial tone within three seconds. There are three conditions which determine the actions taken by the system as a result of these tests.

(a) If the number of failures is less than seven, the DTST program will do one of two things. If DSP is not active at this time, the program does nothing. If DSP is active, the program will stop DSP and set appropriate bits to print a DSP NORMAL message on the traffic and maintenance TTYs. The program will also

extinguish the DSP lamp on the maintenance panel.

(b) If the number of failures is seven, eight, or nine, the program will not change the status of DSP. If DSP is active, it stays on, and, if it is not active, the program does not turn it on.

(c) If the number of failures is greater than nine, the program will attempt to activate DSP. If DSP is already activated, no further action is taken. If DSP is not activated, a check is made to determine if DSP is allowed. If it is denied, a DSP DENIED message is printed on the maintenance and traffic TTYs and the major alarm is turned on. If DSP is allowed, the program will activate DSP, light the DSP lamp on the maintenance panel, activate the major alarm, and output a DSP ACTIVE message on the maintenance and traffic TTYs.

2.03 The DSP check is made continuously 24 hours per day and cannot be turned off. However, the telephone company has the option to either allow or deny the system to activate DSP. Normally DSP is allowed by manually inputting the following TTY message:

(1) T SY:DSP:ALW! This message will allow the system to activate DSP as defined in 2.02.

If DSP has been allowed, the following TTY input message must be used to deny the system to activate DSP:

(2) T SY:DSP:DNY! This message will deny the activation of DSP even though the system determines that DSP is needed.

2.04 After any stable clear initialization, the system will automatically deny DSP and set DTST failures to zero.

2.05 One DSP has been activated, it cannot be stopped until the overload subsides. If an overload condition exists and DSP is denied, it will be necessary to type in the allow message before the system can activate DSP.

2.06 Normally every 25 ms, the wired logic scanner is interrogated for line originations. Originations are detected by the scanner and scan

program as requests for dial tone and are placed in the originating hopper. Originating lines are then assigned to transient call records (TCR) at the beginning of the base level scan, and an attempt is made to select an originating register (OR), a customer digit receiver (CDR), and a path through the network. If successful, dial tone is returned to the customer and dialing can start. If an OR, CDR, or a path is unavailable, the line will be put in a waiting state, and a retry will automatically be initiated once every 0.5 second, regardless of whether the line is defined a class A or class B.

If DSP is allowed, the system can automatically activate DSP causing the following to occur:

(a) Line scanners and the line scanning program will scan for originating class A lines every 25 ms, and class B lines every 50 ms. After timing for false originations (or hits), originating class A and class B lines are placed in the originating hopper. They are removed from the hopper and assigned a TCR by the call processing monitor program.

(b) Once assigned to a TCR, class A lines will be permitted to select an OR, CDR, and a path through the network every 0.5 second until all are found.

(c) Once assigned to a TCR, class B lines will be permitted to select an OR, CDR, and a path through the network every four seconds or whenever the following occurs.

- A line (class A or B) trying to select an OR, CDR, and path goes on-hook
- A line (class A or B) gets an OR, CDR, and path.

(d) When DSP is deactivated, the preferential treatment provided to class A lines terminates.

3. FEATURE FLOW DIAGRAM

3.01 The flow diagram illustrated in Figure 1 is a graphical representation of dynamic service protection.

4. INTERACTIONS

4.01 As described in System Implementation, the *dial tone speed test* is required in order to initiate DSP.

ATTRIBUTES

5. STATION/SYSTEM

5.01 The DSP feature is provided in every No. 2 ESS system.

6. LIMITATIONS

6.01 The number of class A lines is limited by assignment to the network to a maximum of 12.5 percent of the terminals. The number of terminals available for class A lines may be reduced further by assigning trunks and service circuits to those terminals.

7. RESTRICTION CAPABILITY

7.01 This feature is implemented by a TTY message as described in 2.03. Normally, DSP will be denied; however, local company practice may dictate that DSP be allowed in certain offices.

8. COST DATA

8.01 Program store used for dynamic service protection includes:

- Input/Output 25-millisecond interrupt program (IO25M)—23 words.
- Traffic and plant measurement program (TRAFIC)—80 words.
- Line origination and digit reception program (ORIG)—22 words.

8.02 Five call store words are required for DSP. Two words are used exclusively for DSP and three words are shared with other functions.

INCORPORATION INTO SYSTEM

9. PLANNING

9.01 The DSP feature operates in the No. 2 ESS environment. Refer to 6.01, 7.01, and 10.01.

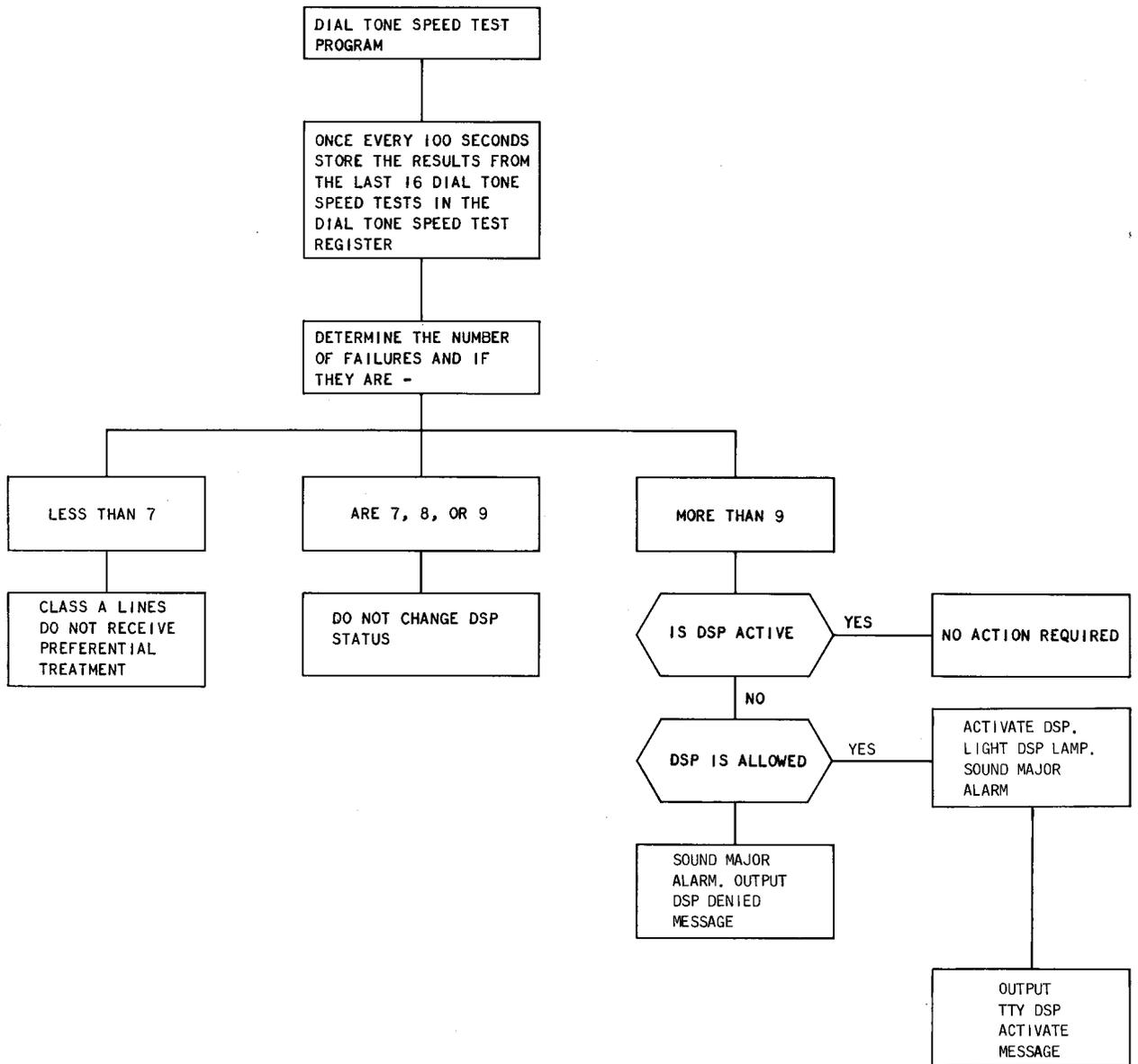


Fig. 1—Feature Flow Diagram Dynamic Service Protection

10. HARDWARE ENGINEERING

10.01 All lines in a central office are assigned to one of two line groups for DSP purposes. Class A lines are lines which are considered essential and may comprise one-eighth (4 out of 32 terminals in each concentrator) of the lines in an office. Terminals at switch 0-level 0, switch 2-level 0, switch 4-level 0, and switch 6-level 0 of all concentrators are considered class A line terminals. The remaining terminals are class B.

11. SOFTWARE ENGINEERING

11.01 There are no special software requirements for the DSP feature. Refer to 19.01.

12. COMPATIBILITY

12.01 There are no compatibility or equipment interface problems with the DSP feature.

13. OFFICE DATA

13.01 Translations: Class A lines are provided by assigning to level 0 on switch 0, 2, 4, or 6 on any concentrator. All lines assigned to those terminals are class A lines. Lines assigned to any other terminal are class B lines.

Recent Change: Lines may be assigned to class A or class B by assignment of terminal equipment number (TEN).

Office Data Administration: Lines may be assigned as class A or class B by assignment of TEN on ESS 2100, 2101, or 2105 input forms.

14. GROWTH/RETROFIT PROCEDURES

14.01 This feature has no special growth or retrofit requirements.

15. TESTING

15.01 Not applicable.

ADMINISTRATION

16. MEASUREMENTS

16.01 The QO3-QO4 registers indicate DTST failures which activate DSP.

17. RECORD KEEPING

17.01 A separate preferential assignment list is provided for class A lines by the Western Electric Company for initially assigning TENs. Output form ESS 2171-R must be retained with assignment information in order to properly administer class A and class B lines. Refer to TG-2H for details.

18. CHARGING

18.01 Not applicable.

AVAILABILITY

19. NEW INSTALLATIONS

19.01 The DSP feature is included in all No. 2 ESS generic programs. The telephone companies have the choice to either allow or deny this feature.

20. GROWTH/RETROFIT

20.01 Not applicable.

SUPPLEMENTARY INFORMATION

21. GLOSSARY

21.01 The following list identifies terms used in this feature document.

- **Dial Tone Speed Test (DTST)**—DTST is a means by which a switching system measures the grade of dial tone service its customers receive. This is done by measuring the time to provide dial tone to system-originated test calls. These test calls are performed at a rate of one test every four seconds, or 900 tests per hour. The ratio of test failures to total tests performed determines the dial tone grade of service. A DTST is considered to have failed if the time to provide dial tone exceeds three seconds. Five failures out of eight tests are an indication that the system is experiencing a traffic overload condition.

- **Teletypewriter (TTY)**

22. REASONS FOR REISSUE

22.01 This is the initial issue of this section.

23. REFERENCES

23.01 The following documents may be referred to for supplementary information concerning the DSP feature.

- PD-2H107-01 *Program Specification—Input/Output 25 Millisecond Interrupt Program*

- PD-2H116-01 *Program Specification—Traffic and Plant Measurement Program*

- PD-2H203-01 *Program Specification—Line Origination and Digit Reception Program.*

- Bell System Practices:

Section 232-122-301 *Dynamic Service Protection Application No. 2 Electronic Switching System.*